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SGR Special Report

Squalor in Science: A Review of the "Baltimore" Case

With a recommended verdict of fraud and coverup from the Office of Scientific Integrity (OSI) at the National Institutes of Health, the so-called Baltimore case is assured a prominent place in the annals of corruption in science.

In a minutely detailed 121-page report dissecting a five-year-long controversy, OSI concluded that the principal target of the investigation, Thereza Imanishi-Kari, of Tufts University, "fabricated" data for what was initially regarded as a breakthrough paper on immunology, published in *Cell* in April 1986. The report also said that she "repeatedly presented false and misleading information" to NIH's investigators.

Her distinguished co-author and namesake of the case, Nobelist David Baltimore, President of Rockefeller University, was not implicated in the fabrication of data. But he was chastised in the OSI report for defending the paper long after "evidence mounted that serious problems existed" in crucial data. Throughout the long episode, Baltimore quarterbacked the defense of the paper, and depicted Congressional interest in the case as a political attack on scientific freedom. Many prominent members of the science establishment rallied to his call. OSI described Baltimore's behavior in the controversy as "extraordinary," "deeply troubling," and "startling."

And, in an unusual tribute to the former postdoc whose career was derailed after she challenged Baltimore and company, Margot O'Toole, the OSI report described her actions as "heroic in many respects." The report states, "She deserves the approbation and gratitude of the scientific community for her courage and her dedication to the belief that truth in science matters."

Compounded by Stanford University's recently revealed depredations against the US treasury [SGR, March 1, 15], the political costs of the Baltimore episode could be high. An aura of rectitude is the golden ingredient in science's beneficial relations with politics. But the record is stained with the kind of hustling and evasiveness associated with callings assumed to possess less holiness than science.

As scientific scams go, the Baltimore case would have been a run-of-the-mill entry, except for Baltimore's eminence and his attempt to divert attention from scientific misconduct with lofty warnings of a political assault on science. Early in the controversy, Baltimore and his co-authors published a correction of what they described as minor and excusable errors in the paper. But even as Imanishi-Kari's fabrications were revealed in Congressional testimony, Baltimore continued to cast the controversy in terms of political hostility to science—until OSI's damning verdict became public on March 15.

On March 20, following widespread leaks of the confidential OSI draft report on the case, the coverup became untenable. In direct response, Baltimore requested withdrawal of the paper he had adamantly defended in inquiries by two universities, NIH, and Congressional investigators.

As the conclusions of the OSI investigation proceed through a review process at NIH and beyond, there's curiosity about whether Baltimore's presidency of Rockefeller can survive the scandal. Sources familiar with Rockefeller

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In Brief

Neglect of priority-making, rather than insufficient funding, is the most troublesome problem in US research policy, according to a long-awaited report, *Federally Funded Research: Decisions for a Decade*, by the Congressional Office of Technology Assessment. The report, unveiled March 20 at a House hearing, is the most up-to-date and critical review of the federal research system. But whether anybody's disposed to listen is another matter. Available around mid-April, a summary edition: (S/N 052-003-01232-4; 43 pp., $2.50), order from: USGPO, Superintendent of Documents, Washington, DC 20402-9325; tel. 202/783-3238. The full report is due in May.

Bernadine Healy easily sailed through a Senate confirmation hearing for the Directorship of NIH on March 14 and was confirmed by the full Senate on the 21st. Still to come is a swearing-in ceremony, tentatively in early April, after which she'll start work. The post has been held on an acting basis by Deputy Director William Raub since August 1989—the longest stand-in in NIH's history.

Talk of scaling down the space station used to grate America's major partner in the venture, the European Space Agency, which complained it had invested heavily in hardware on the basis of NASA's original, grandiose designs. But with Germany heavily burdened by the costs of reunification, NASA's downscaling is drawing no gripes from ESA, though US scientists are protesting that the revisions throw a lot of good science overboard.

A new addition to NSF's data bases on Japan: a listing of 130,000 Japanese researchers, their research topics, and affiliations. Details in NSF 90-144, NSF Publications Unit, R. 232, 1800 G St. NW, Washington, DC; 202/ 357-3619.

. . . The Link to NIH: Mavericks Feder and Stewart

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note that the Board of Trustees there hired Baltimore last year just when the case was unraveling, and that these patricians are not likely to impugn their original judgment.

Of greater certainty, however, is that Imanishi-Kari faces a bleak professional future, and she may be confronted by criminal charges. Severing the tow line after often vowing he would not abandon a colleague in distress, Baltimore said last week, "It is up to Imanishi-Kari to resolve" questions about the paper. It would thus appear that a collegial relationship between the two has been replaced by an adversarial one. This is nothing new in academe, of course, but throughout the controversy it was rumored, but never confirmed, that Baltimore was assisting with Imanishi-Kari's legal expenses.

The performance of the principal figures in the case was amply dismaying. But even more so was the eagerness of many prominent persons in science to echo the specious contention that the inquiry into fakery was a political attack on scientific freedom—akin to saying resistance to bank robbery is interference with free enterprise. But by toughing it out, especially by denigrating their pursuers, Baltimore and company came very close to getting away with it.

To appreciate the gamy flavor of the Baltimore affair, it is necessary to go back to 1986, when O'Toole, a postdoc in Imanishi-Kari's lab at MIT, raised questions about portions of the *Cell* paper, co-authored by Baltimore, Imanishi-Kari, and four others. O'Toole, who had not participated in the reported research, said she was unable to repeat the results reported in a crucial experiment. Furthermore, she said, the *Cell* report was not substantiated by the data in 17 pages of Imanishi-Kari's lab notes that she had come across. Her concerns led to brief whitewash inquiries at MIT and at Tufts, where Imanishi-Kari was soon to take a new job.

O'Toole later testified in hearings chaired by Rep. John Dingell (D-Michigan) that in the course of the Tufts inquiry, Imanishi-Kari "threatened legal action against me and ended the conversation with saying I was not to return to the laboratory." O'Toole said that when she suggested that she might express reservations about the paper in a letter to *Cell*, Baltimore replied that "he couldn't imagine they would publish it, and the first thing that would happen is the editor would call him and he would write a rebuttal."

O'Toole was fired from Imanishi-Kari's lab, labeled a troublemaker, and denied recommendations for jobs in the small community of immunological research. At age 33, she took an office job in her brother's moving company.

The case, and O'Toole's scientific career, would almost certainly have ended there, but for an element of luck. At that time, the science establishment was assuring the public that several recent episodes of scientific misconduct were actually isolated, atypical events—"99.9999 percent of [scientific] reports are accurate and truthful," *Science* Editor Daniel E. Koshland Jr. wrote in the issue of January 9, 1987.

A less trusting view was held by two researchers at NIH, Ned Feder and Walter Stewart, who, on a moonlighting basis, were exploring accuracy in scientific publication.

The timing of Koshland's Panglossian assessment may not have been fortuitous. The *Science* editor had rejected, with expressions of disdain, a paper by Feder and Stewart documenting numerous errors in research published in various mainstream journals. Editors at several other journals praised the Feder-Stewart paper, but said they feared they would be sued for publishing it. A Congressional hearing publicized the plight of the authors. After a prolonged period in editorial limbo, and extensive revisions designed to fend off legal problems, the paper, "The Integrity of the Scientific Literature," was published in the January 15, 1987, issue of *Nature*—only a few days after the Koshland editorial.

The paper's publication in that prestigious journal lent weight to Feder and Stewart's self-assigned role in the promotion of scientific purity. Gradually diminishing their laboratory research, they became a kind of maverick fraud squad at NIH, shunned by many researchers there but tolerated by the management. So-called whistle-blowers sought them out, including a former pre-doctoral fellow in Imanishi-Kari's lab, Charles Maplethorpe, an MD. Working with the 17 pages of notes taken from the lab by O'Toole, Feder and Stewart prepared a manuscript disputing the validity of the *Cell* paper. The NIH Office of Extramural Research, homebase of the forerunner of OSI, reviewed the manuscript and said it would appoint a panel of three outside consultants to conduct an inquiry.

The scene now shifted to Capitol Hill, where the Washington grapevine had conveyed word of this strange scientific brawl to the steadfastly cynical staff of Rep. John Dingell, Chairman of both the Energy and Commerce Committee, which has jurisdiction over NIH, and its Sub-

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Two Dissents and Ahead a Long Review Process

The OSI report on the Baltimore case drew a mild dissent from two of the five-member scientific panel that served as consultants to the investigation. But in contrast to NIH's first investigation of the case, the expert panel was peripheral to the production of the latest report, and the dissents are not likely to have significant impact.

Hugh O. McDevitt, of the Stanford University School of Medicine, and Ursula Storb, of the University of Chicago, described the report as "thorough, comprehensive, and detailed." But while stating that "inconsistencies" in the *Cell* paper "are certainly disturbing," they demurred from a finding that the data were fabricated on the grounds that "alternate scenarios are sufficiently plausible that we cannot agree with the conclusions as stated in the report."

In NIH's first encounter with the Baltimore case, the investigation and report, issued in January 1989, were the work of a panel which consisted of McDevitt, Storb, and Joseph M. Davie, of Searle. In the second go-round, which took place under NIH's newly instituted Office of Scientific Integrity, the panel was enlarged to include William R. McClure, of Carnegie Mellon, and Stewart Cell, University of Texas Medical School, Houston.

But, as is noted in the OSI report, "The function of the panel members, like that for all OSI investigations, was to serve as individual consultants to OSI, which would make the determination about scientific misconduct."

Listed as conducting the investigation was an OSI "workgroup" consisting of Suzanne W. Hadley, Barbara R. Williams, Brian W. Kimes, James E. Mosimann, John A. Sogn, and, in the later stages, Jules V. Hallum, the newly appointed Director of OSI.

Though the OSI findings are morally devastating for the accused, a lengthy review process lies ahead. The principal figures cited in the report have until April 15 to comment on the draft. Their comments will be considered for amending the draft, which then goes to the Director of NIH for approval, with OSI's recommendations for "sanctions." The only name cited in connection with sanctions is that of Imanishi-Kari, who, according to a covering letter to the report, "will be afforded an opportunity to comment on the range of possible sanctions that might be imposed by the Public Health Service."

If approved by the NIH Director, the report and recommendations then go to the Assistant Secretary for Health, James O. Mason, who "is the final deciding authority for all PHS findings and recommended sanctions concerning possible scientific misconduct, with the exception of recommendations for disbarment" [from receiving NIH funds or serving on NIH advisory bodies].

Disbarment decisions are made by the Deputy Assistant Secretary for Management and Acquisition in the Department of Health and Human Services, and the process allows the accused "a hearing de novo on the factual basis for the proposed debarment." Last year, NIH withdrew a grant held by Imanishi-Kari on the basis of doubts about her "fitness" for receiving government funds. The case is also under review by the US Attorney's Office for possible criminal violations.

Meanwhile, O'Toole is working as a researcher at a Cambridge, Mass., biotechnology company. She has been hailed as hero on the front page of the *New York Times* and has been interviewed by *60 Minutes* and various other news organizations. She is surely a shoo-in for various prizes, including the annual Scientific Freedom and Responsibility award of the American Association for the Advancement of Science (publisher of *Science* magazine).

The turnabout in O'Toole's lonely and desperate plight brings to mind Samuel Johnson's observation: "Is not a Patron, my Lord, one who looks with unconcern on a man struggling for life in the water, and, when he has reached ground, encumbers him with help?"

Baltimore

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committee on Oversight and Investigations. Dingell, whose default setting is a strident, prosecutorial manner, is a powerful figure in Washington. With great success, he has pursued miscreants in defense contracting, high finance, the pharmaceutical industry, and elsewhere. In April 1988, Dingell's Subcommittee held hearings titled, "Fraud in NIH Grant Programs." Dealing with several festering misconduct cases under review at NIH, the hearing focused on the methods employed by NIH to prevent, as Dingell put it, the diversion "of precious dollars into meaningless or fraudulent work . . . "

The hearing soon brought out that NIH had initially planned to appoint two co-authors of various writings with Baltimore to the panel assigned to investigate the *Cell* paper but had backed off under Dingell's forbidding glare. Dingell inquired about the policies governing appointments to such panels, and engaged in the following exchange with Mary Miers, the NIH official then in charge of investigating allegations of misconduct:

Miers: Sir, our policy is to avoid a conflict of interest. Obviously, a financial or institutional affiliation is a conflict of interest. It is not as clear that co-authorship constitutes a

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. . . O'Toole Says Panel Fooled by Faked Notebook

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conflict of interest, but I agree with you that it's better to avoid it.

Dingell: In the interviews that the staff of this committee had with you, you supported and defended the appointment of the two individuals referred to, the co-author of the text with Dr. Baltimore, and the person who co-authored 14 papers with Dr. Baltimore; is that not so?

Miers: Sir, I still believe they would have been objective.

Baltimore was not invited to testify at the hearing. A month later, in a widely circulated "Dear Colleague" letter, he assailed the hearing as "totally unnecessary," and charged that "What we are undergoing is a harbinger of threats to scientific communication and scientific freedom."

The NIH inquiry got under way in May 1988 with a newly recruited panel, acceptable to all, consisting of Joseph M. Davie, President for Research and Development at Searle; Hugh O. McDevitt, Chairman of the Department of Microbiology, Stanford University School of Medicine, and Ursula Storb, Professor of Molecular Genetics and Cell Biology, University of Chicago.

Its report, issued in January 1989, contained a mixed verdict. Unlike Tufts and MIT, the panel did not exonerate Baltimore et al., reporting, instead, that the *Cell* paper contained "significant errors of misstatement and omission, as well as lapses in scientific judgment and interlaboratory communication." It recommended publication of several corrections, but the main conclusion was that "no evidence of fraud, conscious misrepresentation, or manipulation of data was found."

In support of these conclusions, the NIH panel cited laboratory records presented by Imanishi-Kari as the underpinnings of the published experiment. The panel added in its report that it "was impressed by the amount of work done in support of the studies published in the paper in *Cell*, by the completeness of the records, and by the abilities of both Drs. Imanishi-Kari and Weaver [a co-author and protege of Baltimore] to find, accurately interpret, and present data on experiments that were performed as much as three or four years earlier."

From Baltimore's perspective, the only sour note was sounded by then-NIH Director James B. Wyngaarden, who, following a staff recommendation, reprimanded Baltimore and Imanishi-Kari in identical letters: "It appears that even though the allegations [by O'Toole] have been known to you and the other coauthors of the *Cell* paper at least since the spring of 1986, the coauthors never met to consider seriously the allegations or to reexamine the data to determine whether there might be some basis for the allegation. Such an analysis on the part of the paper's authors, followed by appropriate action to correct such errors of oversight, may well have made a full investigation unnecessary."

Wyngaarden specified that the corrections recommended in the report should be sent to NIH for approval before publication—an obvious slight to the trustworthiness of a Nobel laureate. But the reprimand was light, focused on procedure rather than fraud.

While the Baltimore camp claimed victory, O'Toole was presenting a horrific hypothesis to NIH and the Dingell Committee, namely, that the lab notes presented to the panel by Imanishi-Kari did not exist at the time of the initial challenge to the paper, but had been hurriedly fabricated to throw the NIH inquiry off the trail of fraud. Dingell announced that he would examine these allegations at hearings early in May 1989. Advised of O'Toole's allegations of a coverup, NIH Director James Wyngaarden ordered the investigation reopened. Baltimore and several close associates then proceeded to mount a public-relations campaign focused on the theme that Dingell represented powerful forces hostile to scientific freedom.

In a "Dear Colleague" letter sent to several hundred scientists, in April 1989, three weeks before the hearing, Phillip A. Sharp, Director of the MIT Center for Cancer Research, wrote that Dingell's "Subcommittee has decided to continue to hassle David [Baltimore] and the other authors and this has serious implications for all of us." The recipients were urged to oppose the Dingell inquiry in op-ed submissions and letters to the editor and Congress. Sharp sent along a sample letter, with the salutation "Dear Congressman," which stated, "It is difficult to fathom the motives behind the Subcommittee's current actions. But I believe that to continue what many of us perceive to be a vendetta against honest scientists will cost our society dearly. If scientists who have been exonerated of all wrongdoing must continue to defend themselves against vague and shifting charges, all members of the scientific community must be afraid."

Two weeks later, in an op-ed article in the *New York Times*, Robert E. Pollack, a professor of biology who was then Dean of Columbia College, stated that "the way Dr. Baltimore is being treated means that witch-hunts are in the offing." He added that "if Congress legislates against error in science, there is no chance that a sensible young person will choose to be a scientist . . . " He did not address the effect that O'Toole's misfortunes might have on scientific recruitment.

Science, in a News and Comment article one week before the hearings, stated, "Baltimore says he feels 'hounded' by Dingell. Many leading researchers see Dingell's pursuit of the Baltimore case as a way of attacking science itself. . . . As *Science* goes to press, it's too early to gauge the response to Sharp's call for an outpouring of outraged support. But some are saying Dingell will become the Joe McCarthy of science, because the case is being exaggerated out of all proportion to its significance."

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. . . Baltimore Warns of Threats to Scientific Freedom

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The unidentified "some" included David Baltimore, who, prepped by legal and public relations counsel, addressed a well-attended meeting of the DC Science Writers Association on May 3, the eve of Dingell's second hearing in the case. Baltimore opened the meeting with a discourse on windsurfing, a new hobby, he said, in which he found characteristics akin to the ups and downs of scientific research and life itself. He easily batted generally sympathetic questions, while maneuvering around queries concerning the criticisms in the NIH panel's report.

Included in a packet of papers distributed to the audience by a member of Baltimore's entourage was a "Backgrounder" that referred to the beginnings of the dispute over the *Cell* paper. "I was impressed by the quality of O'Toole's analysis," Baltimore stated in the Backgrounder, "and believed that further experimentation might validate certain of her points and could make a valuable contribution to science." But, he added, "O'Toole expressed no desire to carry the matter further." Regarding his refusal to cooperate with Feder's and Stewart's requests for data, he stated, "I viewed their request as inappropriate, mainly because they were not trained in immunology and therefore lacked the expertise to judge the data."

At the second set of hearings by Dingell, held on May 4 and 11, 1989, Dingell produced what he expected would be a bombshell—Secret Service forensic specialists who testified that major segments of Imanishi-Kari's notebooks were produced several years after the experiments for the *Cell* paper were supposedly conducted. Their testimony, concerning analyses of paper and ink, dovetailed with O'Toole's contention that Imanishi-Kari had fabricated the notebooks to mislead the NIH investigators.

However, Dingell, who highly values public-relations points, fared poorly. Well-prepared for the hearing, Baltimore scored heavily against Dingell by depicting the presence of the Secret Service as further evidence of an assault on science. "I must tell you, Mr. Chairman," Baltimore declared in a hearing room packed with his supporters, "I am very troubled about how this situation got so out of hand. I have a very real concern that American science can easily become the victim of this kind of government inquiry." Referring to Imanishi-Kari, Baltimore noted that she didn't speak English well, adding, "She deserves my support, and the support of all scientists, for any of them could be in her shoes."

Baltimore then smoothly sailed past a great potential embarrassment. A subpoena by Dingell's Committee had pulled from his MIT files an apparently incriminating letter from the very early days of the controversy. Written by Baltimore at the time Professor Herman Eisen, of MIT, was looking into O'Toole's allegations, the letter referred to problems with a reagent, Bet-1, used in the experiment, and stated: "The evidence that the Bet-1 antibody doesn't do as described in the paper is clear. Thereza's statement that she knew it all the time is a remarkable admission of guilt. Neither David Weaver [co-author and researcher in Baltimore's lab] nor I had any idea that there was a problem or ambiguity with the serum. Why Thereza chose to use the data and to mislead both us and those who read the paper is beyond me." Concerning whether a published correction was in order, Baltimore wrote: "The literature is full of bits and pieces now known to be wrong, but it is not the tradition to point each one out publicly."

Confronted by Dingell, Baltimore described the letter as the product of language difficulties. Eisen, he said, had misunderstood a remark by Imanishi-Kari and had conveyed the misunderstanding to Baltimore, who, in an excitable state, had written to Eisen "a letter of which I am not proud, and a letter which can easily be misconstrued."

In his testimony, Baltimore insisted that apart from inconsequential errors, which had been corrected, the *Cell* paper was sound. Corroboration was offered by Henry Wortis, who had headed Tufts' 1986 investigation of O'Toole's allegations. The long-running dispute was now meaningless, Wortis explained, because the experiments reported in the *Cell* paper had been confirmed by other researchers. Testifying under oath, as Dingell requires of all witnesses, Wortis said, "Some of the experiments have been done. I am aware of them and there is—in fact, the central conclusions have been confirmed. Those have not yet been submitted for publication, however," he assured the Committee. Two years later, neither confirmation nor refutation has been published. Wortis declines to discuss the matter. Noting that he testified under oath, Committee staff suggests the matter might warrant further examination.

In public relations points, Baltimore was the clear winner, reaping favorable press coverage and emerging as a spokesman for scientific freedom against political intrusions. But though little noted by the general press, the hearings also brought out several puzzling, interesting items. Dingell observed that a near-final draft of the NIH panel report, obtained by his staff, contained words of praise for O'Toole that were absent from the final report. Wyngaarden and the panel members agreed they were originally present and should have remained in the draft, but could not explain their mysterious absence.

Responding to Dingell, Wyngaarden said, "All I can say is that I did not excise them." Panel Chairman Joseph Davie said that "we do not have a good explanation for why that specific reference was removed."

"That means it must have been the NIH staff or some other person, perhaps in the dark of night," Dingell said, adding, "I'm just trying to find out how and what is the integrity of these panels you set up." The mystery has never

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. . . Baltimore Chastised for Response to NIH Inquiry

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been solved, but a savvy speculation is that some well-placed traditionalist in the review system bought the perception of O'Toole as a troublemaker, and saw no point in praising her assault on the integrity of a superstar of science.

Asked to account for ordering a renewal of the investigation, Wyngaarden referred to O'Toole's allegations of fabricated data and said, "The new information you have shared with us on this case is extremely disturbing." The NIH Director then volunteered, "Clearly, Dr. O'Toole has taken considerable risk in bringing this case to the attention of officials at MIT and Tufts University and insisting that the truth be learned. We are concerned that Dr. O'Toole's scientific career has been damaged simply because she pursued her convictions."

The May 1989 hearing also produced the following exchange between Baltimore and Rep. Ron Wyden (D-Oregon):

Wyden: Dr. Wyngaarden believes that Dr. O'Toole did the right thing. Do you share his view?

Baltimore: Yes, I think I said in my opening statement that raising those kinds of concerns about a scientific study is perfectly appropriate, and that I feel that the reviews that were held at Tufts and at MIT were an appropriate institutional response to the nature of her question, and came up with, in fact, an appropriate answer.

Wyden: Do you think additional protections are needed for whistle-blowers?

Baltimore: I find the position of whistle-blowers a very difficult thing to understand. And not having had the responsibility for thinking about it, I must say I haven't thought about it all the way through. But I certainly understand that it is a personally very difficult position for somebody to be in, to blow a whistle.

Wyden: Are you concerned about Dr. O'Toole's potential career prospects at this point?

Baltimore: I don't know much about Dr. O'Toole's scientific interests. I don't know what she wants to do with her life.

Wyden: Would you help her at this point?

Baltimore: I don't think the kind of research that I do is of particular interest to her.

The reopened inquiry, in progress since the fall of 1989, drew barbs, from SGR and elsewhere, for its slow pace. But the final product, meticulously crafted and documented, provides luster for OSI and vindicates its decision to value thoroughness over speed. The draft report displays precision, but conveys some passion about the record and the issues involved.

Thus, concerning Baltimore, it states that his initial defense of Imanishi-Kari "may be understandable," but adds that "it is difficult to comprehend his maintaining this stance as the evidence mounted that serious problems existed with the serological data in the *Cell* paper." Noting that Baltimore told the May 1989 Dingell hearing that Imanishi-Kari "deserves my support, and the support of all scientists," the OSI draft points out, "These statements were made after the first NIH investigative panel reported it had found 'significant errors of misstatement and omission . . .' in the *Cell* paper and the same day the United States Secret Service testified that nearly 20 percent of [Imanishi-Kari's] notebook was questionable from a forensic standpoint."

Referring to an OSI interview with Baltimore on April 30, 1990, the OSI report states: "Dr. Baltimore's most recently expressed views are the most deeply disturbing." When informed that OSI suspected that Imanishi-Kari had fabricated data, "Dr. Baltimore," the report states, "disputed the significance of the . . . data and he asserted that if they were fabricated, the NIH was somehow responsible for this act of scientific misconduct.

" 'If those data were not real,' " the OSI report quotes Baltimore as saying, " 'then she (Dr. Imanishi-Kari) was driven by the process of investigation into an unseemly act. But it does not go to the heart of any scientific issue . . .' "

The OSI report continues: "Dr. Baltimore went on to say that '. . . if something is not published, it's in your notebooks and it's not published, that is not then a matter for those rules to be followed.' " Continuing to quote from the April interview with Baltimore, the OSI reports him as saying, " '. . . [I]n my mind you can make up anything that you want in your notebooks, but you can't call it fraud if it wasn't published. Now, you managed to trick us into publishing—sort of tricked Thereza—into publishing a few numbers and now you're going to go back and see if you can produce those as fraud. But, I think you should see that was a forced situation.' "

OSI commented that it "found Dr. Baltimore's statements to be extraordinary. They are all the more startling when one considers that Dr. Baltimore, by virtue of his seniority and standing, might have been instrumental in effecting a resolution of the concerns about the *Cell* paper early on, possibly before Dr. Imanishi-Kari fabricated some of the data later found to be fraudulent."

Regarding O'Toole, the report stated she "suffered substantially for the simple act of raising questions about the accuracy of a scientific paper. The loss of her position in Dr. Imanishi-Kari's laboratory is only the most visible symbol of the price exacted of her after she raised the challenges to the paper. Notwithstanding the losses and costs she incurred, Dr. O'Toole maintained her commitment to scientific integrity . . . . At a point at which she might understandably have been disillusioned with investigations and investigators, she confidently asserted the truth as she knew it. . .

"Dr. O'Toole's actions were heroic in many respects. She deserves the approbation and gratitude of the scientific community for her courage and her dedication to the belief that truth in science matters."—DSG

More In Print: Computing, Social Science Budgets

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ogy is eagerly sought and adapted, and the government backs industrial consortia to push the development of technologies.

Seeking Solutions: High-Performing Computing for Science (GPO Stock No. 052-003-01227-8; 38 pp., $2.25), from the Congressional Office of Technology Assessment, a brief review of issues arising from rapidly growing federal programs to promote high-speed scientific computing and supporting facilities, including national communications networks—budgeted for an interagency R&D total of $638 million in the President's FY '92 proposals. Until recently, OTA states, NSF and the Pentagon "quietly developed computer and network related programs without major Administration initiatives or Congressional actions." But now it's different, the report adds, noting policy concerns in various quarters, including "why science should get preferred access to what ultimately may become a universal communications service . . . " The background report, forerunner of a major OTA work due later this year, hints at a previously expressed OTA theme on management of the big computer systems: lack of a central authority in the federal establishment. Until this year, Congress was far ahead of the White House in pushing supercomputing. But the Administration has asserted itself with proposals for next year, developed under the White House's Federal Coordinating Council for Science, Engineering, and Technology.

Order from: USGPO, Superintendent of Documents, Washington, DC 20402-9325; tel. 202/783-3238.

Research Facility Financing: Near-Term Options (19 pp., no charge), from the Government-University-Industry Research Roundtable, part of the National Academy of Sciences, a review of possibilities for providing academe with more money for lab facilities. In and out of science, this is an increasingly nettlesome subject, with researchers on alert against diversion of research funds to bricks and mortar, helpful Congressmen earmarking appropriations for buildings, and the White House, in apparent exasperation, wiping out the facilities program in next year's NSF budget. The Roundtable report, offered as "a possible starting point" for discussion, includes among the options accelerated depreciation, matching formulas for federal funds, and a requirement that the facilities component of indirect costs actually be used for renewing facilities. The report candidly acknowledges that none of the options is painless.

Order from: National Academy of Sciences, Government-University-Industry Research Roundtable, 2101 Constitution Ave. NW, Washington, DC 20418; tel. 202/334-1681.

Investing in Biological Diversity: US Research and Conservation Efforts in Developing Countries (94 pp., $15.50), from the World Resources Institute (WRI), Washington-based policy-research non-profit, by WRI Associate Janet M. Abramovitz, reports that US government and private organizations spent nearly $63 million in 1093 conservation and related research activities in 127 developing countries in 1989. Figures for 1987 were $37 million and 873 projects. Along with a great deal of data and tracking of trends there's an envious note, increasingly common in policy-research reports: "Compared to the amounts devoted to such other worthy endeavors as mapping the human genome ($3 billion) and measured against the pressing need to conserve the earth's biological wealth for the benefit of current and future generations, the total amount invested by the US in global diversity—$62.9 million in 1989—is still very small."

Order from: WRI Publications, PO Box 4852, Hampden Station, Baltimore, Md. 21211; tel. 301/338-6963.

FY 1992 Budgets for Social and Behavioral Science Research (31 pp., $10), annual sifting from opaque regions of the federal budget, by the Washingotn-based Consortium of Social Science Associations (COSSA), which keeps a hawkeye watch on government affairs of interest to its constituents.

Order from: COSSA, 1522 K St. NW, Suite 836, Washington, DC 20005; tel. 202/842-2788.

Correction

SGR erred March 15 in stating that Walter Massey resigned from the National Science Board (NSB) upon recently becoming Director of NSF. Massey had not been a member of the NSB since 1984. Barred from holding two Presidential appointments, he did resign from the President's Council of Advisers for Science and Technology, but has accepted an invitation from Science Adviser D. Allan Bromley to attend Council meetings. Also, as NSF Director, Massey returns to the NSB as an ex-officio member.

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In Print: Magaproject Inventory, Eastern-Bloc R&D

The publications listed are obtainable as indicated—not from SGR.

Science Megaprojects: Status and Funding, February 1991 (91-258 SPR, 4 pp., no charge), from the Science Policy Research Division of the Congressional Research Service (CRS), part of the Library of Congress, a compilation—first of its kind, to SGR's knowledge—of the big-ticket items that are terrorizing devotees of "little science." Prepared by Genevieve Knezo, Specialist in Science and Technology, the listed megaprojects comprise 30.4 percent of federal civilian R&D appropriations this year, and are budgeted in the Bush '92 proposals to rise to 33.7 percent. Meanwhile, Defense megaprojects would rise from 8.4 percent to 11.3 percent of Pentagon R&D. Included are expenditures to date and concise assessments of the legislative outlook. The report applies the megaproject tag to a wide-ranging list. Included are such regulars as the space station, the SSC, NASA's Earth Observing System, and magnetic fusion. Thrown in with them are AIDS research, boosts for science and math education, and the National Agricultural Research Initiative—mainly little-science projects bundled in very large packages.

Also from the CRS Science Policy Division: ***Eastern European and Soviet Science and Technology: Capabilities and Needs*** (91-114 SPR, 34 pp., no charge), a generally gloomy view of the state of science and technology in the former Iron Curtain countries, drawn mainly from various assessments published in recent years. Written by William C. Boesman, the report states that "the scientific and technical establishments of the Eastern European countries are modeled largely on that of the Soviet Union," adding that "just as these societies and their political structures have been distorted by the Soviet hegemony of the last 45 years, so have their science and technology." The report notes that "a shifting of Soviet R&D resources from the military sector to the civilian sector, without other required changes," would probably hurt the military without helping the civilian sector. On the bright side, the report points out that each of the former bloc nations possesses some scientific strength; also, that in science as in other matters, the Soviets, particularly the Russians, "will do whatever they can to survive."

Another from CRS Science Policy Division: ***The Semi-Gas Systems Sale: Technology and National Security Issues*** (91-263-SPR, 14 pp., no charge), a summary and analysis of what may be a landmark case in US industrial policy, the pending purchase by Japan's Nippon Sanso of Semi-Gas Systems, a Hercules subsidiary that is said to have developed unique technologies for semiconductor manufacturing. The sale is opposed by SEMATECH, the Pentagon-subsidized semiconductor manufacturing consortium, on national-security grounds, but has been approved by the federal Committee on Foreign Investment in the United States, a moribund outfit that's supposed to monitor these things. The Justice Department has temporarily blocked the sale on grounds of excessive market concentration. The CRS report, by Glenn J. McLoughlin, observes that the Justice Department action sidesteps the national-security issue and leaves "unclear whether any new policy determinations have been made by the federal government on protection of critical technologies, particularly those which involved direct or indirect federal funding."

Order from: Science Policy Research Division, Congressional Research Service, Library of Congress, Madison Building, Washington, DC 20540; attn. Ms. Raap; tel. 202/707-7014.

Gaining New Ground: Technology Priorities for America's Future (77 pp., $20), from the Council on Competitiveness, Washington outpost of high-tech industry and various academic allies, a strong prod to the Bush Administration to be more supportive of American industry in world competition. The Council unveiled the report March 20 at hearings held by Senator Ernest Hollings (D-SC), Chairman of the Commerce, Science, and Transportation Committee. The report notes that the US alone "has not singled out industrial competitiveness as one of its national R&D priorities," adding that "federal funding of R&D for industrial development is almost non-existent."

However, the report follows the Bush-Sununu line of limiting federal industrial aid to pre-competitive, generic technologies—but urges more of it. Hollings said, "We're really talking about money"—and scoffed at the Administration's paltry requests for funds in this area. Presentation of the report brought a rare public appearance by former NSF Director Eric Bloch, a Distinguished Fellow of the Council, who said, "Science is as important as it has always been, but we are at a turning point because generic technologies are becoming more critical. Support for the coordinated research and commercialization [!] of these technologies is essential."

(The Council on Competitiveness, referred to by a Congressional wit as "Republicans for Industrial Policy," was founded in 1985 and should not be confused with the President's Council on Competitiveness, founded by Presidential Executive Order in 1989 and housed in the offices of and chaired by Vice President Quayle.)

Also from the original Council on Competitiveness: ***Japanese Technology Policy: What's the Secret*** (41 pp., $10), by David W. Cheney, a Senior Associate at the Council, and William W. Grimes, a former Associate, an admirably short and clear inventory of the ingredients of Japanese industrial prowess. Major items: Industry and government assign high priorities to commercial applications, government agencies compete to help industry develop technologies, defense R&D is low, foreign technol-

(Continued on Page 7)